

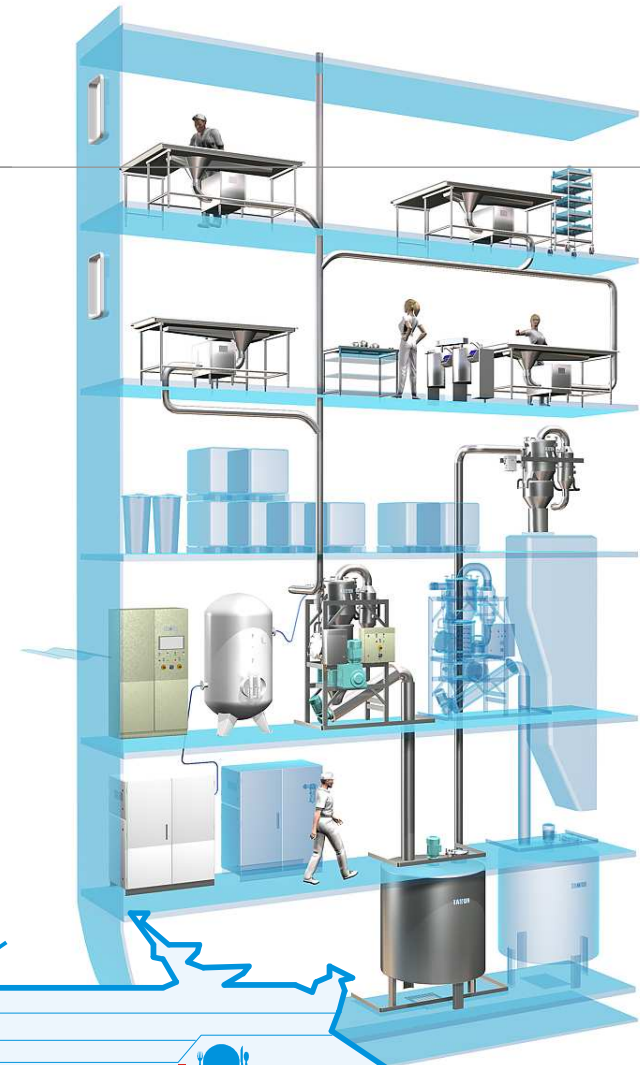
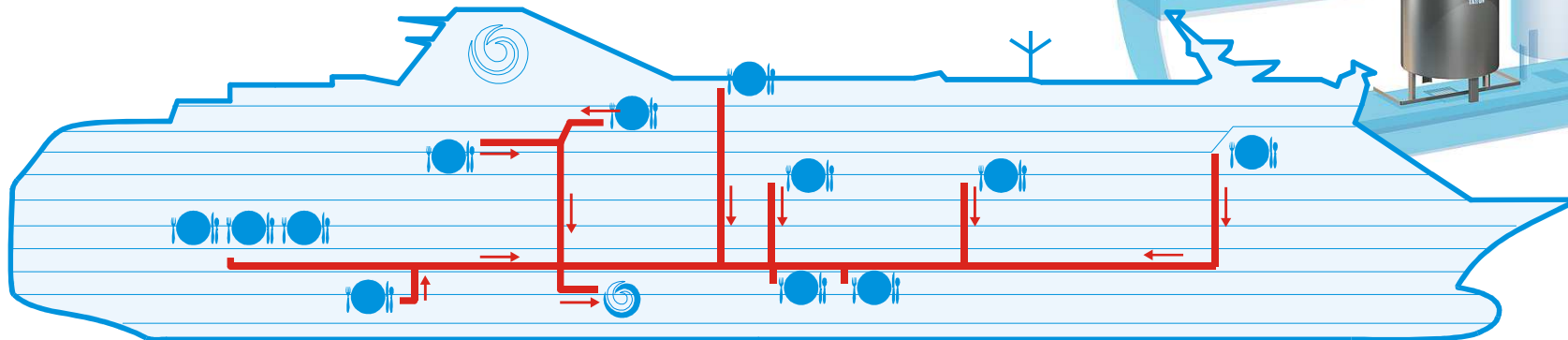
# collecting **conveying** galleys

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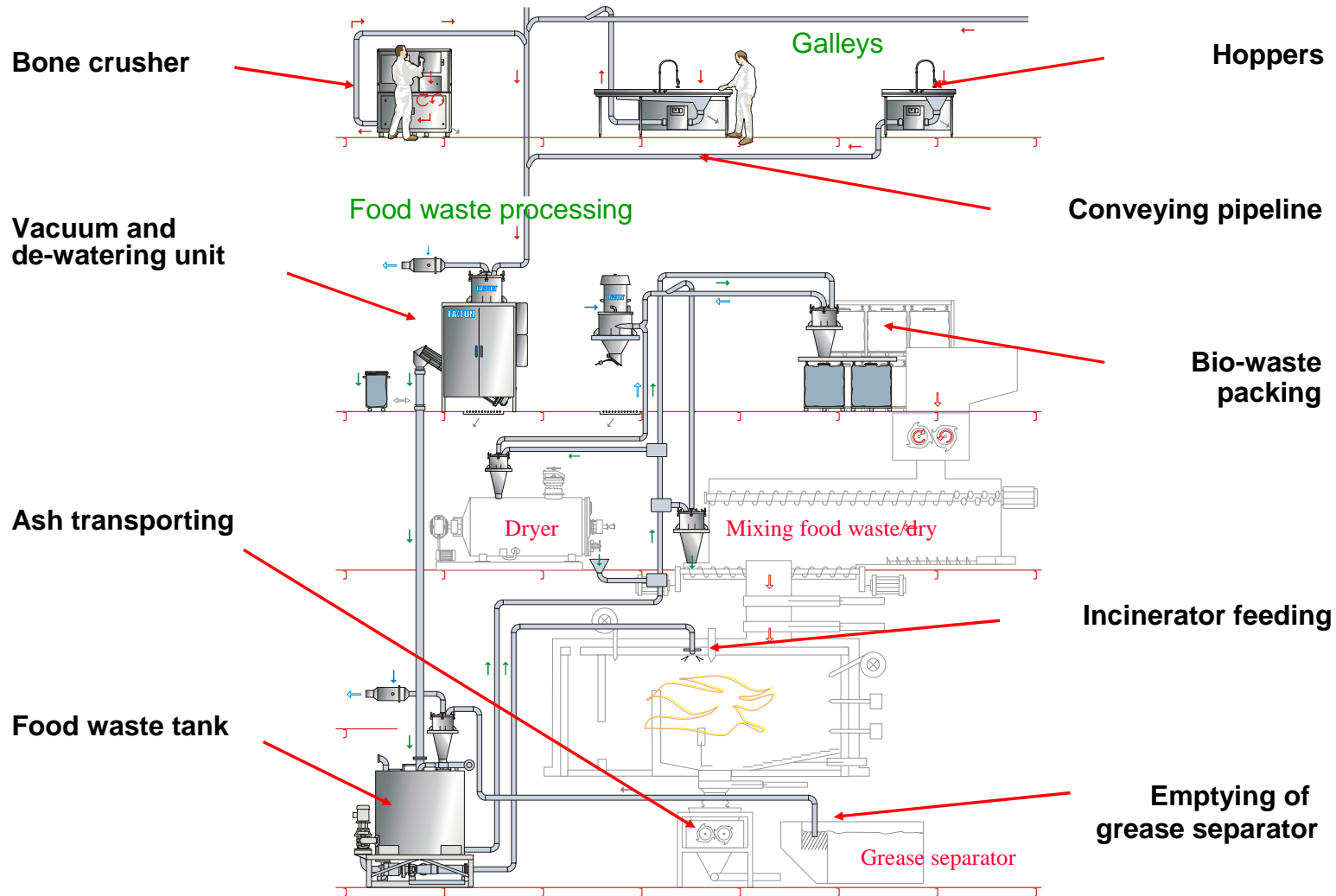
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# Food waste solutions - Marine Galleys

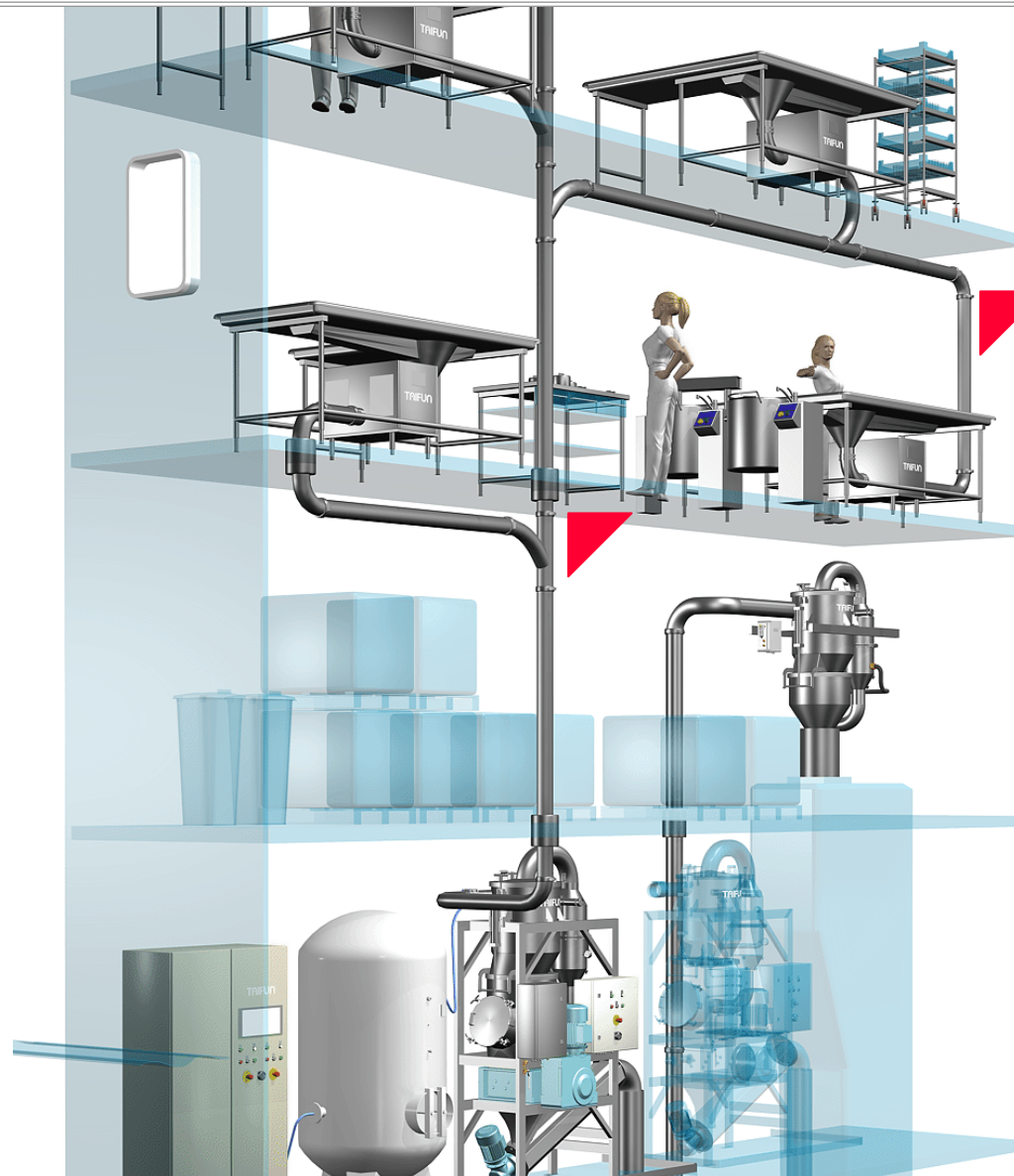
- Hoppers in galley and pantry area
- Integrated bone crushers
- Single conveying pipeline
- Vacuum and de-watering unit
- Food waste tank
- Bio waste packing
- Incinerator feeding
- Ash transporting
- Grease separator emptying



# Taifun Food Waste Vacuum Conveying System



# Taifun Food Waste Management Concept



## Pipe coupling system

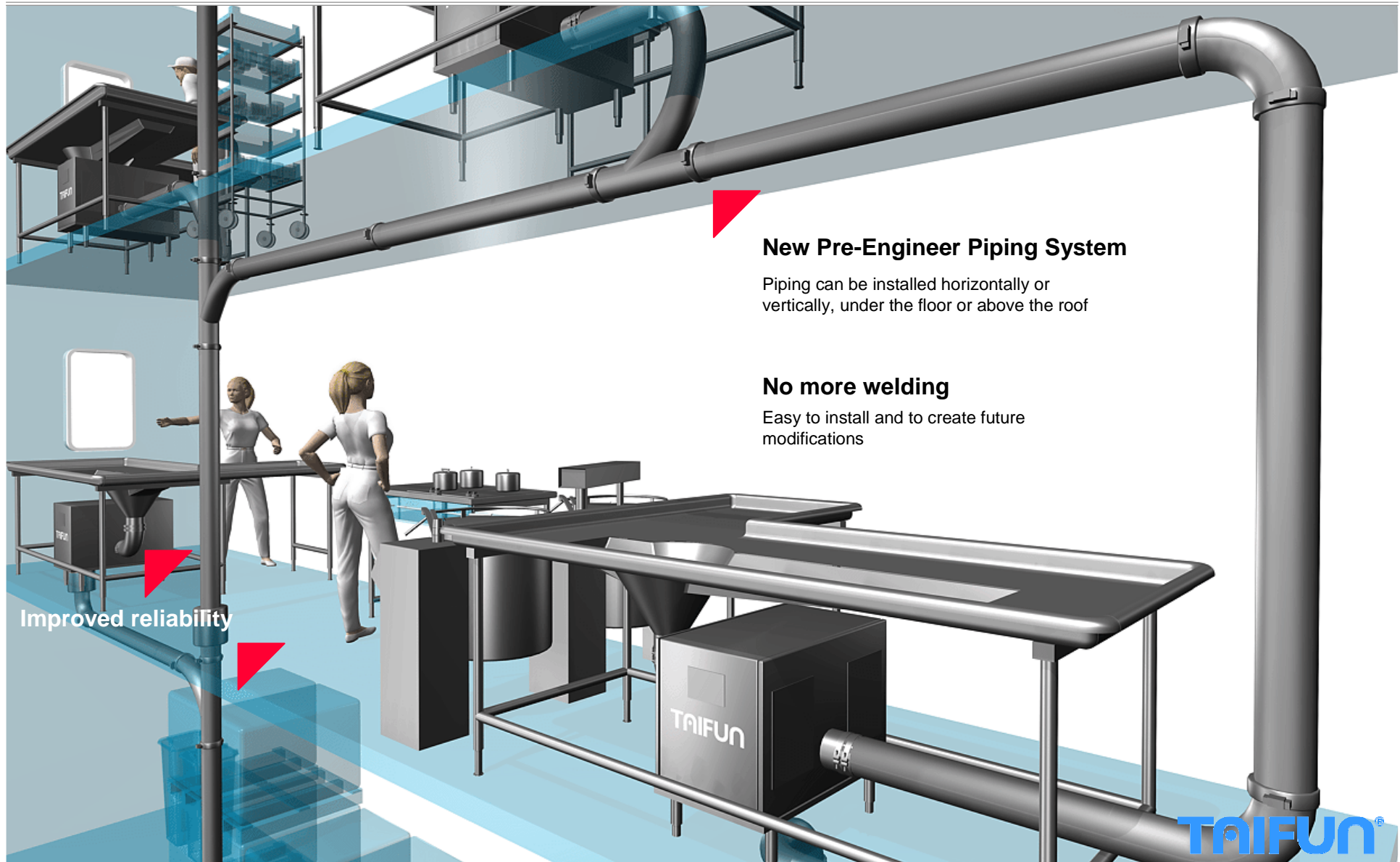
Pre-fabricated piping, pipe parts and connectors

## Bulk head penetration

New pipe coupling system parts include also bulk head penetration parts for marine applications

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# New Piping and Pipe Components



## New Pre-Engineer Piping System

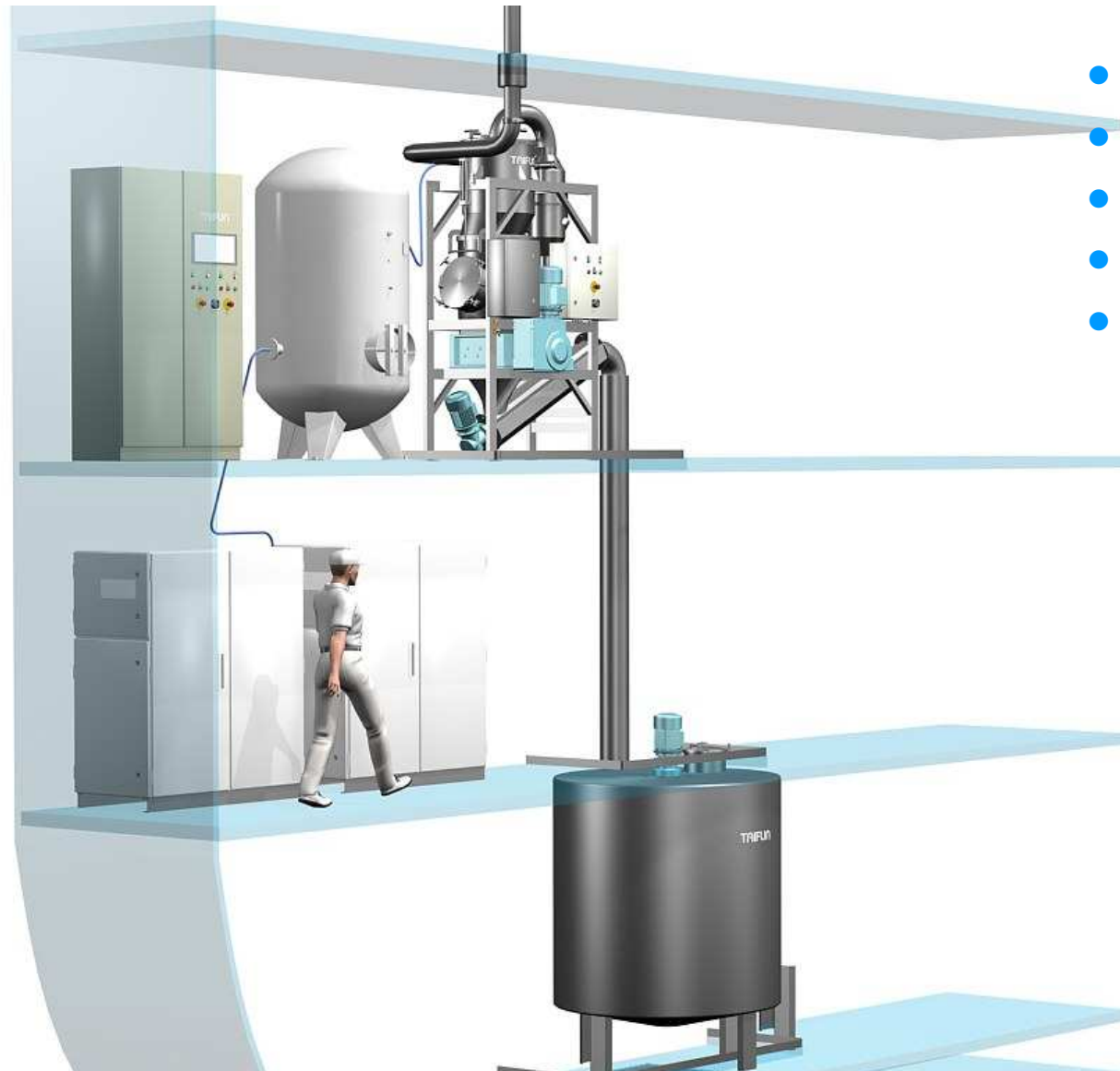
Piping can be installed horizontally or vertically, under the floor or above the roof

## No more welding

Easy to install and to create future modifications

Improved reliability

# Taifun Food Waste Management Concept

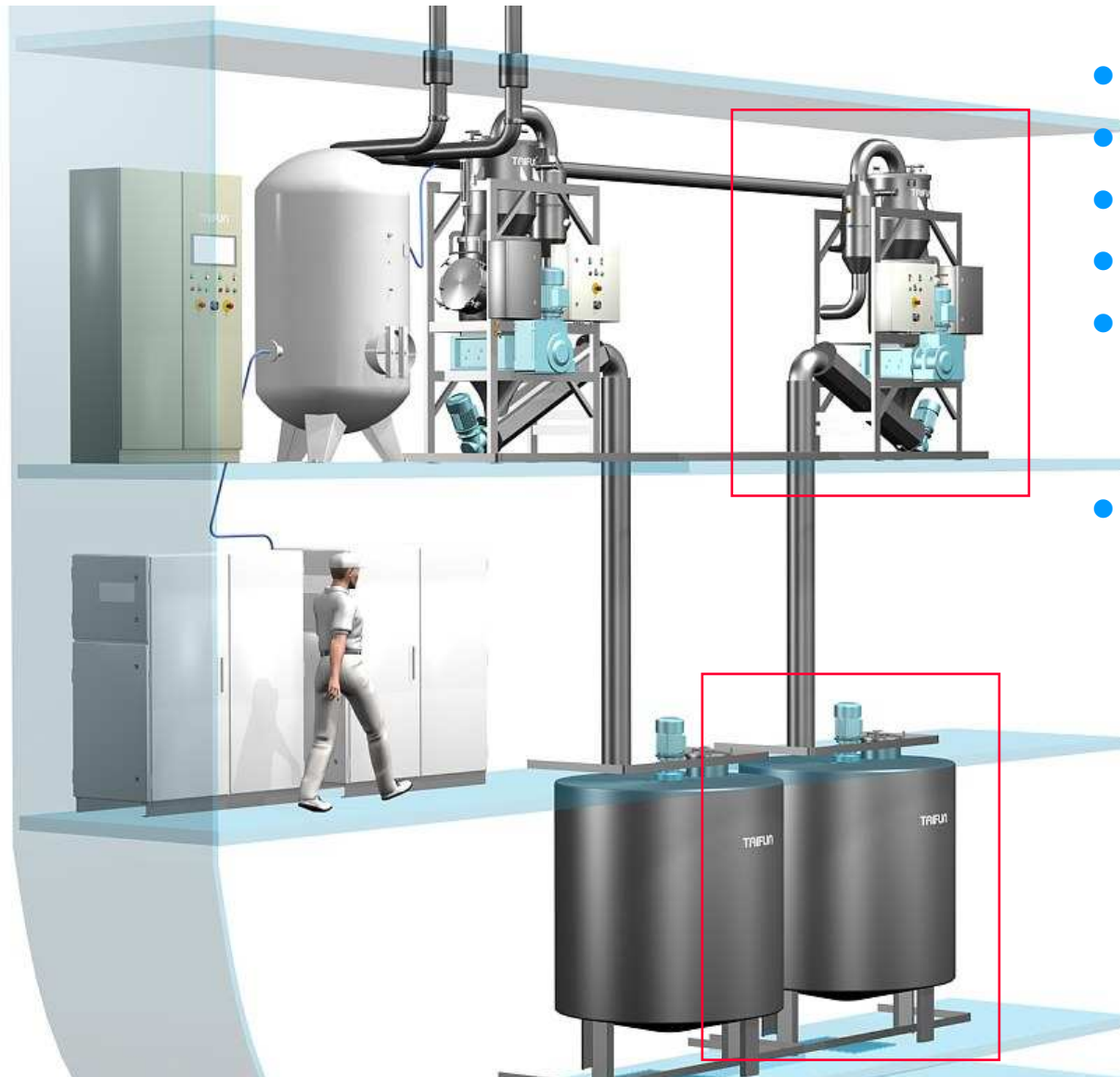


- Taifun food waste machinery
- Taifun air buffer tank
- Taifun automation
- Compressor
- Taifun food waste tank

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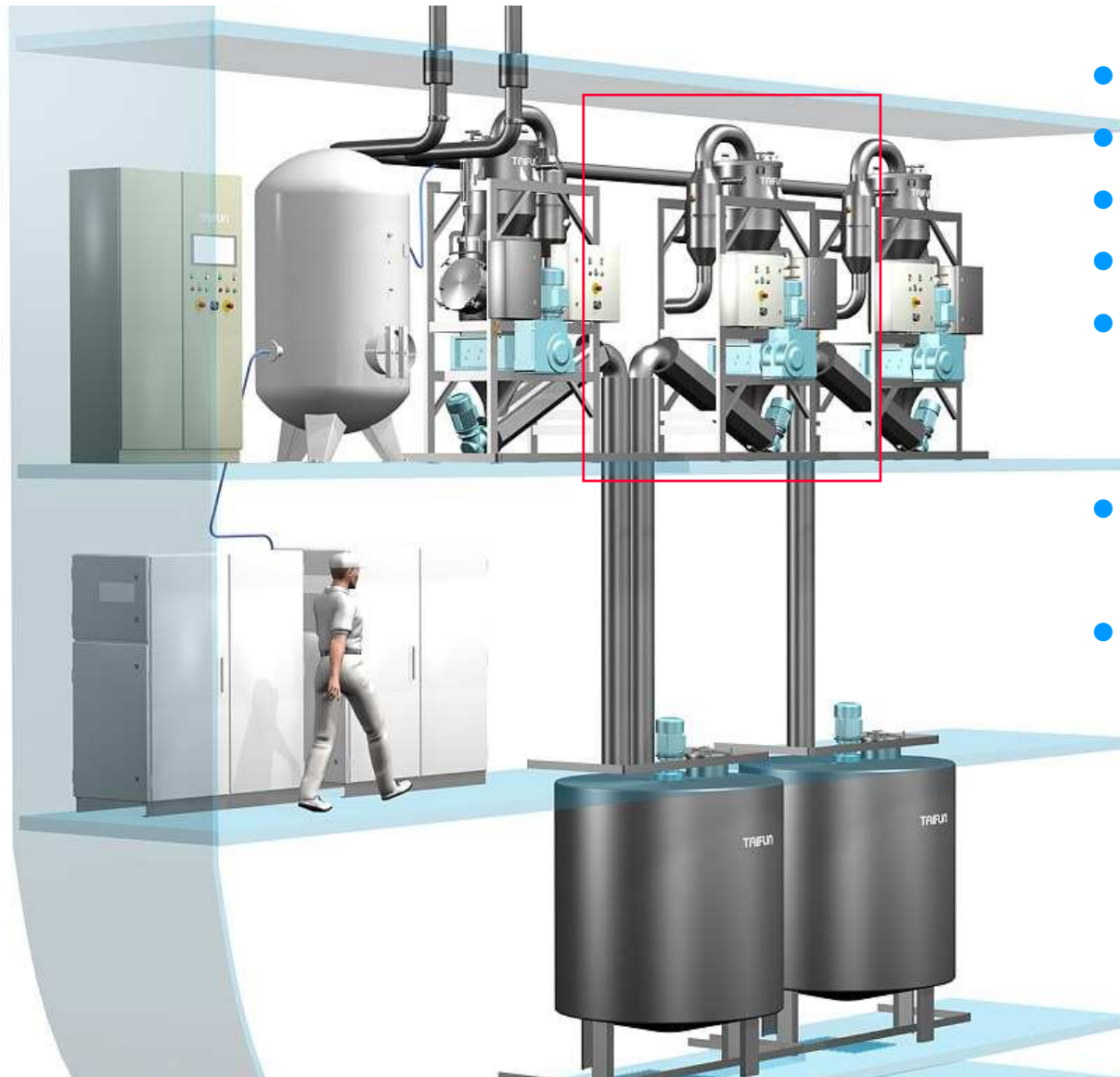
# Taifun Food Waste Management Concept



- Taifun food waste machinery
- Taifun air buffer tank
- Taifun automation
- Compressor
- Taifun food waste tank
- Additional capacity

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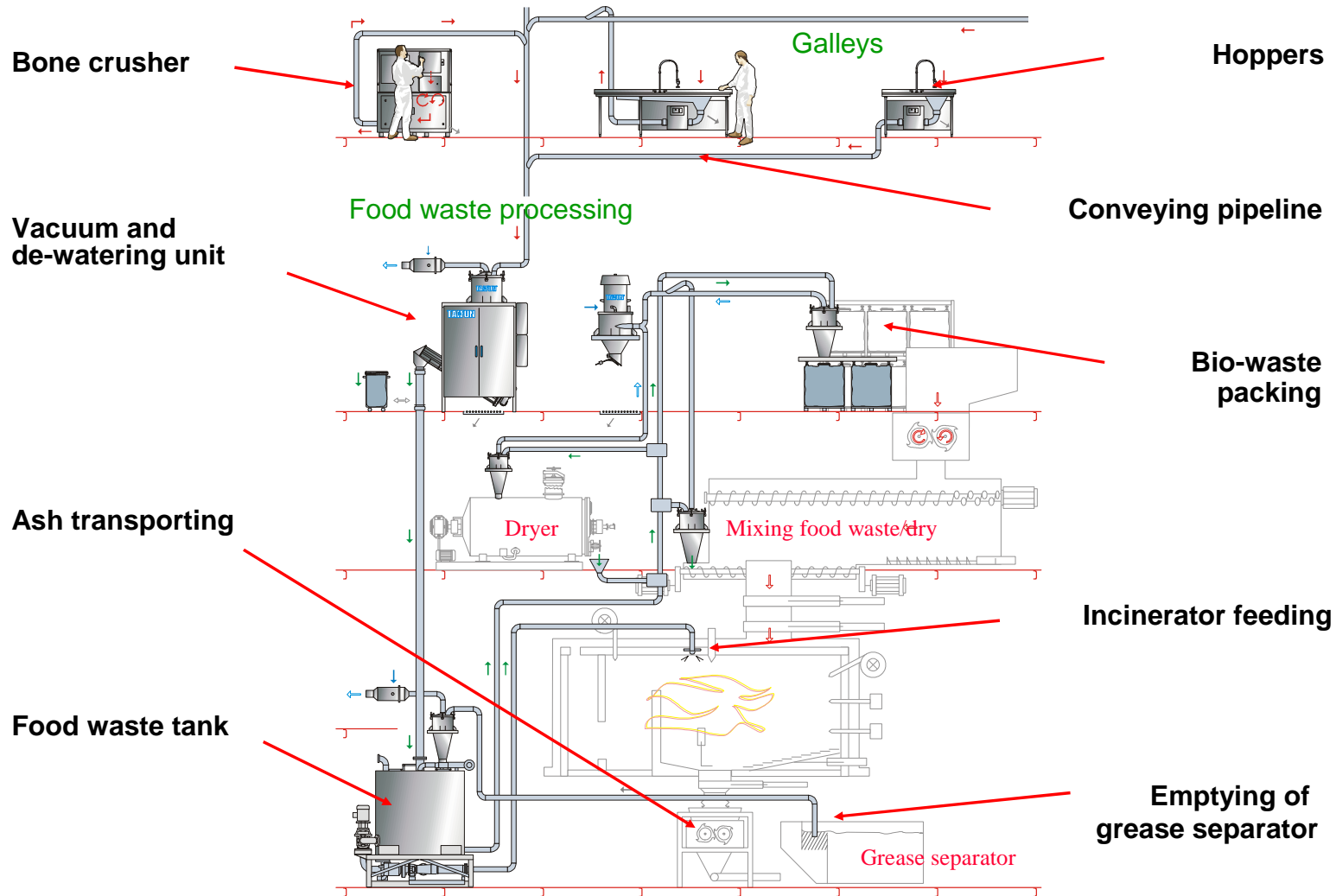
# Taifun Food Waste Management Concept



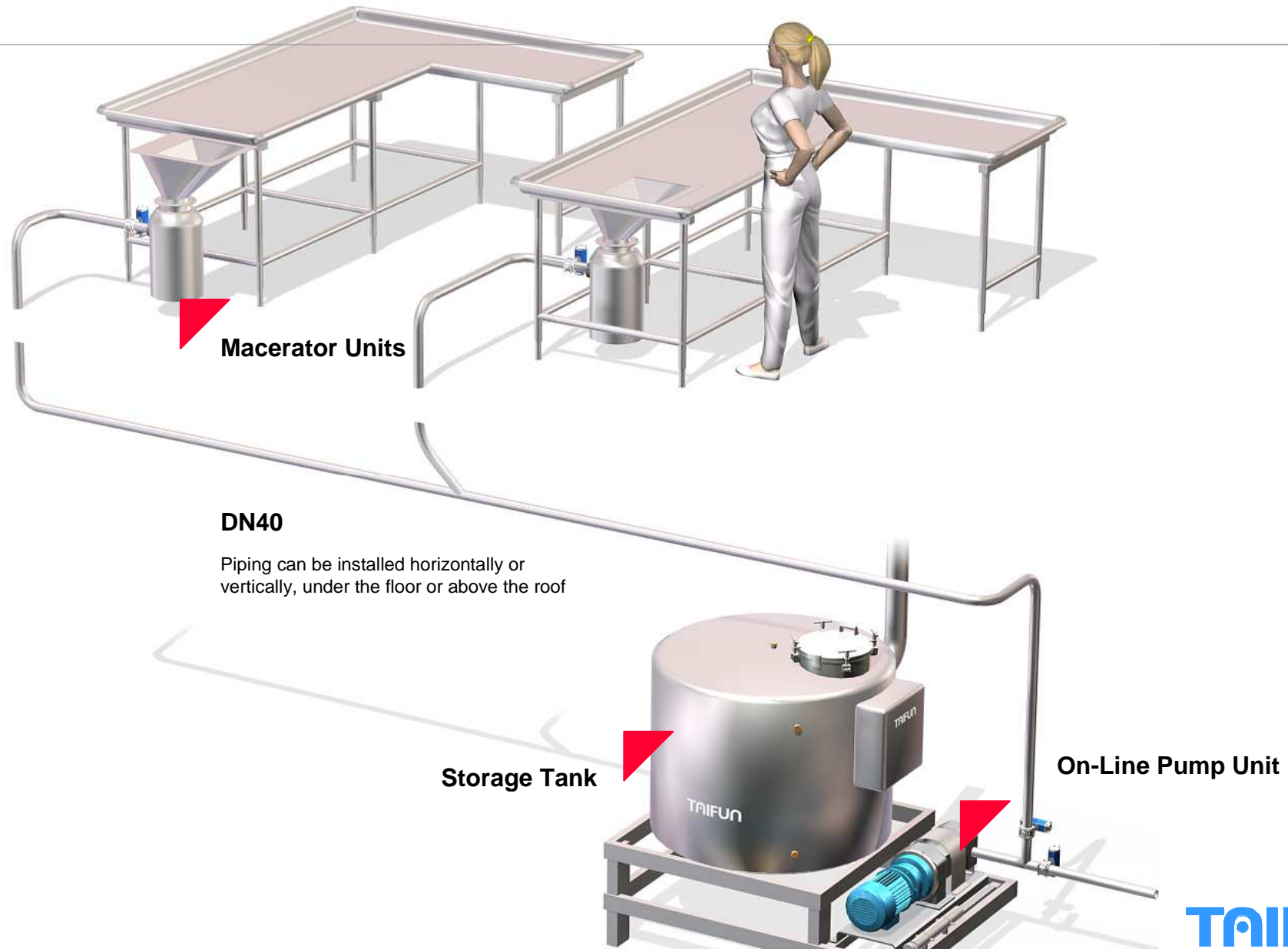
- Taifun food waste machinery
  - Taifun air buffer tank
  - Taifun automation
  - Compressor
  - Taifun food waste tank
- 
- Additional capacity
  - Additional flexibility, reliability and easy maintenance



# Taifun Food Waste Vacuum Conveying System



# On-Line Vacuum Conveying System



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# benefits

customer **benefits**

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# Advanced operation

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- No water as transport media
- Galley grey water production reduced to a minimum
- Significantly less highly contaminated grey water
- Safe operation-No crusher required for standard hoppers
- Programmable suction sequence
- Can be run by timer - no idling
- No garbage bags to be lifted/transported
- New possibilities of galley/pantry design.
- Improved ergonomics and efficiency



# More hygiene

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- Fulfils today's requirements and demands
- No cross contamination between clean and soiled operations
- No contaminated slurry water - no stench
- Automatic washing system



# Simple installation

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- Single pipeline - 50% less piping and 50% lower weight
- Significantly reduced weight of each feeding station
- Easy pipe work planning - less engineering hours
- Minimal installation restrictions
- Pipeline can be installed both horizontally and vertically
- Only low voltage supply in galley areas
- Less grey water holding tank capacity needed





# Easy maintenance

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- Simple technical design
- Modular components, replace from stock - repair at work shop
- Less rotating parts
- Less wear and tear parts
- Less maintenance
- Less spare parts
- All components and surfaces in contact with food waste are made of stainless steel



# Cost savings summary

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- Less fresh water production needed
- Less grey water treatment necessary
- Additive savings
- Maintenance and spare part savings
- Less electric energy consumption



# Summary – Shipyard view

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- **Vacuum principle – in case of leak, the system is vacuuming the material not spraying the slurry around**

In the Taifun Food Waste Management System the vacuum is sucking the material unlike from the pulper system where pressurised water is conveying the material. In case of a leakage in a traditional pulper system the slurry is spraying around, making hazardous hygienic situations especially in the galley areas and making harm to the insulation, the decorative etc. and spreading unpleasant odours to public areas.

- **Only potable water supply to the waste hoppers, no waste water back to the galley**

No problems with the sanitary authorities, the hygienic Taifun system is using only approx. one (1) litre of potable water per suction. No waste water is used in the conveying process.

- **At least 60% less weight in waste hopper construction than pulper**

The Taifun workstation, consisting only of a hopper and a valve-/control box has a much simpler construction and is therefore much lighter than a pulper station.

- **Vacuum pipeline is empty in use, pulper system is full of water in use resulting more weight!**

- **No high voltage electrical supply to the galley areas – only 24 V control cabling**

No complex wiring consisting of different voltages supplied from various power boards are needed. The hoppers need only a 24 V control cable.

# Summary – Shipyard view

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- **Design of the piping layout – can be installed horizontally and vertically**

The waste is conveyed by vacuum, which means that no slope is needed towards the incinerator/waste room. This gives more flexibility to the design; the pipeline can go upwards or downwards from the collecting point making the installation easier when no deck penetrations are needed.

- **Saving engineering hours**

Because no slope is needed the pipeline doesn't need to be planned as carefully as with conventional pulper systems. Leaving more working flexibility when welding the hull sections together and connecting the pipe ends.

- **Faster and easier installation in galleys**

The Taifun workstation, consisting of a hopper and a valve-/control box is much easier and faster to install when no complex piping system together with pumps, shredders, crushers etc. are needed to be synchronised and adjusted.

- **Single pipeline is easier installation**

The benefits from using only one pipeline are easy to understand. Less installation work is needed to be done, and when taking both the working hours and the needed material into calculations, over 35% can be saved when comparing a system with ten (10) hoppers.

# Summary – Shipowner view

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- **75% Less water consumption**

The need of water is minimised. Normally water is only added during the washing process.

- **Waste collection hopper is ergonomically designed and tailor made – less space needed**

The waste hopper, in its smallest version takes up floor space only one (1) m<sup>2</sup>. This leaves more “space” for the galley/pantry design, and allowing a more effective production process to be carried out. The hoppers can be fully tailor made according to the use and need.

- **Needed maintenance is much less for the Taifun system than in a pulper system**

The Taifun conveying is based on vacuum conveying. The vacuum is generated by using an ejector. This results in a nearly maintenance free and easier managed system with a longer lifetime than the conventional systems based on water conveying.

- **Spare parts need is much less**

No grinders in the hopper tables results in less maintenance and spare parts need.

- **Less energy consumption than pulper system**

50% lower electrical consumption when comparing Taifun and a pulper system.

- **No additives**

In a pulper system, in order to prevent bacteria growth and unpleasant odour, additives have to be added to the slurry water. The cost for the additives can be more than 36.000 USD/year.

# Summary – Shipowner view

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- **Less moving parts than in a pulper – long life time**

The Taifun conveying is based on vacuum conveying. The vacuum is generated by using an ejector. This results in a nearly maintenance free and easier managed system with a longer lifetime than the conventional systems based on water/gravity conveying.

- **Modular components – easy to modify, extendable**

The Taifun Food Waste Management System consists of three (3) main parts. Hopper(s) – pipeline – vacuum-/de watering unit. The system can easily be changed, reduced or expanded, all depending of the use and need.

- **Self cleaning**

The Taifun Food Waste Management System is highly hygienic. In fact it cleans itself, only the tabletops are needed to be manually cleaned. The used detergent is the same as in dishwashing machines and if requested a centralised dispensing system could be used.

- **Simple construction – more flexibility for galley design**